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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/655,025      | 09/05/2003  | Martin Hoheisel      | 32860-000624/US     | 5214             |

30596 7590 02/09/2005

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| EXAMINER |
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HO, ALLEN C

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| ART UNIT | PAPER NUMBER |
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2882

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/655,025

**Applicant(s)**

HOHEISEL ET AL.

**Examiner**

Allen C. Ho

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 042004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 21 (Fig. 4E).
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 16.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

Paragraph [0047], line 5, both "6b" should be replaced by --6a--.

Appropriate correction is required.

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*Claim Objections*

4. Claims 1, 16, 17, 23-30, 33, and 34 are objected to because of the following informalities:  
line 2, the word "matricially" does not exist. Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 3, 7-17, 25, 26, 31, 33, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Wei *et al.* (U. S. Patent No. 5,231,655).

With regard to claims 1, 3, 7-14, 16, 17, 25, 26, 31, 33, and 34, Wei *et al.* disclosed a method for producing and applying at least one of an antiscatter grid and collimator to at least one of an x-ray and gamma detector having a two-dimensional array of detector elements (42) which forms a detector surface with detection regions sensitive to at least one of x-radiation and gamma radiation and less sensitive intermediate regions (Fig. 4(a)), comprising: producing a basic structure (310) using a rapid prototyping technique to form transmission channels (420) and intermediate walls of at least one of the antiscatter grid and collimator; coating the intermediate walls with a material (330) which strongly absorbs at least one of x-radiation and

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gamma radiation; and applying at least one of the antiscatter grid and collimator to the detector surface (column 5, lines 42 - column 6, line 53).

With regard to claim 15, Wei *et al.* disclosed the method as claimed in claim 1, wherein the basic structure is constructed so as to produce a focused (20) at least one of antiscatter grid and collimator.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2, 19-24, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wei *et al.* (U. S. Patent No. 5,231,655) as applied to claims 1 and 31 above, and further in view of Guru *et al.* (U. S. Patent No. 6,175,615 B1).

With regard to claims 2, 19-24, and 32, Wei *et al.* disclosed the method as claimed in claims 1 and 31. However, Wei *et al.* failed to teach a method of stereolithography is used as the rapid prototyping technique.

Guru *et al.* disclosed a method of stereolithography for prototyping a radiation collimator (column 4, lines 56-61). Guru *et al.* taught that the method of stereolithography permits precise machining and revisions could be easily made for other imaging conditions (column 5, lines 41-48).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the method of stereolithography as the prototyping technique, since a person would be motivated to use a prototyping technique that would allow a person to easily modify the parameters/dimensions of the collimator/grid to custom-fit different imaging conditions.

9. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wei *et al.* (U. S. Patent No. 5,231,655) as applied to claims 1 and 2 above, and further in view of Logan (U. S. Patent No. 5,418,833).

With regard to claims 6 and 18, Wei *et al.* disclosed the method as claimed in claim 1 and 2. However, Wei failed to disclose that the coating is performed by at least one of sputtering and electrolytic deposition.

Logan disclosed that coating could be done by at least one of sputtering and electrolytic deposition (Logan, column 5, lines 1-5).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to coat the intermediate walls using a known process, since a person would be motivated to use a proven process to coat the intermediate walls without undue experimentation.

10. Claims 1, 3, 4, 6, 7-18, 25-28, 31, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan (U. S. Patent No. 5,418,833) in view of Wei *et al.* (U. S. Patent No. 5,231,655).

With regard to claims 1, 3, 7-14, 16, 17, 25, 26, 31, 33, and 34, Logan disclosed a method, comprising: producing a basic structure (10) using a rapid prototyping technique to form

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transmission channels (12) and intermediate walls of at least one of the antiscatter grid and collimator; coating the intermediate walls with a material (13) which strongly absorbs at least one of x-radiation and gamma radiation.

However, Logan failed to disclose an x-ray or gamma-ray detector having a two-dimensional array of detector elements, and applying at least one of the antiscatter grid and collimator to the detector surface.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a digital detector having a two-dimensional array of detector elements, since a person would be motivated to acquire an image in real time.

Wei *et al.* disclosed applying at least one of the antiscatter grid and collimator to the detector surface (Fig. 4(a)).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply at least one of the antiscatter grid and collimator to the detector surface. As disclosed by Logan, scattered x-rays degrade image quality (column 4, lines 34-48). Accordingly, a person would be motivated to improve image contrast by removing scattered x-rays.

With regard to claims 4, 27, and 28, Logan and Wei *et al.* disclosed the method as claimed in claim 1, wherein the basic structure is produced from a material which is substantially transparent to at least one of x-radiation and gamma radiation (Logan, column 5, lines 27-30), and end faces of the intermediate walls are kept free of the coating with the absorbent material.

With regard to claims 6 and 18, Logan and Wei *et al.* disclosed the method as claimed in claim 1 and 2, wherein the coating is performed by at least one of sputtering and electrolytic deposition (Logan, column 5, lines 1-5).

With regard to claim 15, Logan and Wei *et al.* disclosed the method as claimed in claim 1, wherein the basic structure is constructed so as to produce a focused (Logan, 22) at least one of antiscatter grid and collimator.

11. Claims 2, 19-24, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan (U. S. Patent No. 5,418,833) and Wei *et al.* (U. S. Patent No. 5,231,655) as applied to claims 1 and 31 above, and further in view of Guru *et al.* (U. S. Patent No. 6,175,615 B1).

With regard to claims 2, 19-24, and 32, Logan and Wei *et al.* disclosed the method as claimed in claims 1 and 31. However, Logan and Wei *et al.* failed to teach a method of stereolithography is used as the rapid prototyping technique.

Guru *et al.* disclosed a method of stereolithography for prototyping a radiation collimator (column 4, lines 56-61). Guru *et al.* taught that the method of stereolithography permits precise machining and revisions could be easily made for other imaging conditions (column 5, lines 41-48).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the method of stereolithography as the prototyping technique, since a person would be motivated to use a prototyping technique that would allow a person to easily modify the parameters/dimensions of the collimator/grid to custom-fit different imaging conditions.



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12. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souchay *et al.* (U. S. Pub. No. 2003/0081731 A1) in view of Wei *et al.* (U. S. Patent No. 5,231,655).

With regard to claims 1-34, Souchay *et al.* disclosed a method, comprising: producing a basic structure (2) using a rapid prototyping technique to form transmission channels (12) and intermediate walls of at least one of the antiscatter grid and collimator; coating the intermediate walls with a material (14) which strongly absorbs at least one of x-radiation and gamma radiation.

However, Souchay *et al.* failed to disclose an x-ray or gamma-ray detector having a two-dimensional array of detector elements, and applying at least one of the antiscatter grid and collimator to the detector surface.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a digital detector having a two-dimensional array of detector elements, since a person would be motivated to acquire an image in real time.

Wei *et al.* disclosed applying at least one of the antiscatter grid and collimator to the detector surface (Fig. 4(a)).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply at least one of the antiscatter grid and collimator to the detector surface. As disclosed by Souchay *et al.*, scattered x-rays degrade image quality (paragraph [0004]). Accordingly, a person would be motivated to improve image contrast by removing scattered x-rays.

*Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Hoheisel *et al.* (U. S. Patent No. 6,847,701 B2) disclosed an x-ray detector with an applied scattered radiation grid.
- (2) Hoheisel *et al.* (U. S. Patent No. 6,778,632 B2) disclosed a radiation detector with collimator arrangement.
- (3) Bynum (U. S. Patent No. 5,127,037) disclosed a method of reproduction.
- (4) Hull (U. S. Patent No. 4,575,330) disclosed an apparatus for production of a three-dimensional object by stereolithography.
- (5) Tosswill *et al.* (U. S. Patent No. 4,125,776) disclosed a collimator for x and gamma radiation comprising a basic structure and coating on intermediate walls.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho  
Patent Examiner  
Art Unit 2882

07 February 2005